THE 1893 BANK CRASHES AND MONETARY AGGREGATES

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ABSTRACT

The paper explores the effects of the reconstruction schemes of the twelve banks of issue which suspended payment in early 1893 on the behaviour of monetary aggregates. Earlier estimates of narrow and broad measures of money seriously underestimate the contraction in the money stock by not netting out all of the significant proportion of deposit liabilities whose terms of maturity are so lengthened that they are effectively debentures. The paper proceeds by discussing the treatment of this matter in earlier calculations of the money stock. It then constructs an amended series that adjusts for the 'locked up' deposit liabilities and interminable deposit stock. Finally, a further adjustment is made by calculating the market value of the deferred deposit receipts and adding that back into the money supply. Thus a lower and upper bound of an alternative series of Australian monetary aggregates is provided.

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1. INTRODUCTION

The suspension and reconstruction or liquidation of twelve of the Australian banks of issue in 1893 had direct and important implications for the behaviour of monetary aggregates for the next quarter of a century. Estimates of the money supply contained in the Butlin, Hall and White (1971) study of *Australian Banking and Monetary Statistics 1817-1945* provide data for this period that have been widely accepted. But estimates provided in this paper suggest that these data are flawed with respect to the period from 1893 up to World War I. This is primarily because the reconstruction schemes of the Australian banks in 1893 changed the nature of their liabilities to the holders of term deposits[1]. The data for term deposit liabilities in *Monetary Statistics* include very large amounts of liabilities that were in effect debentures, and which consequently should not be counted as part of the stock of money. Revised estimates of the stock of money defined broadly (M2 and M3) from 1893 until 1914 differ significantly from the earlier estimates. In addition, it is possible to estimate the market value of the deferred deposit receipts and stock in the hands of depositors. If this sum, which might be thought of as roughly approximating a certificate of deposit liability, is added back as part of the money stock the resulting contraction is still significantly greater than that shown in series drawn from the Butlin, Hall and White data.

2. EXISTING ESTIMATES OF MONETARY AGGREGATES

2.1. Weakness in Data Set

The data provided by Butlin, Hall and White that have been used to generate estimates of the stock of money were estimates of currency in the hands of the public and various categories of deposit liabilities held by trading and savings

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[1] An earlier flawed estimate presented in Merrett (1988), pp. 20-24 and Table 4, has been used by Pope (1989), pp. 26-28 and Figure 14.

banks. Problems exist with respect to both the currency and deposit data. Estimates of currency in the hands of the public before 1900 are crude in the extreme and cast doubt on the accuracy of the existing figure of M1, or the stock of money narrowly defined (Butlin, Hall and White, 1971, Table 42, pp. 453-457 and pp. 92-94). Currency was an important component of M1, falling from roughly 40 per cent to less than 20 per cent, over the period from 1890 to 1914. Calculations of the value of notes in the hands of the public, which comprised roughly one third of the total of currency, are reasonably straightforward. A more serious problem arises with estimates of the public's holdings of coin, principally gold. These are not known with any level of precision. The series of currency in the hands of the public generated by Butlin, Hall and White which begins in 1901 has been based on an extrapolation from a series of benchmark estimates of the amounts of gold coin in the hands of the public in 1901, 1906 and 1911 made by the New South Wales statistician in 1921 (Butlin et. al., 1971, p. 93). However, Schedvin (1973, pp. 590-591 and note 6) extended the series back into the nineteenth century by extrapolating on a per capita basis. The manner of estimation of currency prevents any accurate measure of hoarding during the several months of banking panic and bank closures.

More serious errors have emerged from the way in which estimates of broad money have been constructed. The nub of the problem is how to treat the deposit liabilities of the reconstructed banks. Deposit holders, with the exception of governments who enjoyed a privileged position as creditors, were offered three choices. Their deposits at the time of suspension, whether current accounts or interest bearing accounts of three to twelve months term, were converted into some combination of preference shares, debenture stock, some of which was interminable, or deferred deposit receipts whose maturity was spread across anything from three to nine years. Of the more than £60m caught up in the reconstruction schemes, a little over £3m were converted into preference shares and another £3m became interminable stock, leaving some £54m as long dated liabilities. The lengthening of the term from twelve months prior to suspension up to a minimum of four years[2] before repayment was to begin after reconstruction

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[2] Under the original schemes of arrangement no repayments were due before 1896 and the Bank of North Queensland was to be the first institution to complete repayment by discharging its obligations in 1899. Most of the repayments were to fall due between 1898 and 1901 (*Banker's Magazine* (1894) p. 890).

suggests strongly that these liabilities should be removed from measures of the money stock.

Butlin, Hall and White did make some minor adjustments to several of their deposit liability series as a result of the terms of the bank reconstruction schemes of 1893. They used the quarterly returns to governments by banks of selected liabilities and assets within colonial and later state boundaries as the principal source of their data. Some of these colonies, notably Victoria and Queensland, altered their short form balance sheet categories, namely by introducing 'other liabilities' to deal with perpetual stock issued by the English, Scottish and Australian Bank and the Queensland National Bank (Butlin et. al., 1971, Table 12, pp. 140-159). However, these amendments do not inspire confidence as no explanation has been given of how the data for individual colonies, shown in Tables 13-16(i), was calculated (Butlin et. al., 1971, Tables 13-16(i), pp. 160-237). These tables cover all states apart from Tasmania. There is no indication that the English, Scottish and Australian Bank issued interminable deposit stock, redeemable at its discretion, in both its initial and 1895 revised scheme of arrangement with its creditors[3], or that the Queensland National Bank's interminable stock was issued under its revised scheme of arrangement which took effect in 1897[4]. Also included in this series of 'other liabilities' are the 'old liabilities of the Commercial Bank of Australia not dealt with under its reconstruction scheme' for 'a few years in the 1890s', those years being 1893 to 1895 (Butlin et. al., 1971, p. 77)[5]. The remaining extended deposit receipts, which comprise most of the liabilities affected by reconstruction schemes were left in with term deposits of normal maturity (Butlin et. al., 1971, p. 77 and p. 80).

The modest adjustments made by Butlin, Hall and White (shown in Appendix A), are incomplete in several respects. Firstly, the series of 'other liabilities' is considerably smaller than the figures for those categories of liabilities supposedly dealt with shown in the balance sheets of the banks in question. Even if the larger balance sheet data are substituted for the Butlin, Hall and White series, they capture no more than a fifth of the deposit liabilities caught up in the reconstruction

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[3] See *Australasian Insurance and Banking Record* (hereafter *AIBR*) (1893), pp. 606-607 and (1896), pp. 417-418.

[4] See *AIBR* (1897), pp. 544-545.

[5] The correct amounts are shown in Appendix A.

schemes implemented in 1893, as will be shown below. Secondly, the amounts which have been deducted from the deposits within Australia by Butlin, Hall and White are overstated by roughly a quarter, as they refer to interminable stock which was held in the United Kingdom as well as in Australia. Furthermore, no adjustments to the data of deposit liabilities to allow for the effects of reconstruction appear to have been made to the aggregate balance sheets of trading banks shown in Table 2(i) of Butlin, Hall and White (1971, pp. 83-84 and pp. 118-119).

The data of interminable stock held in the United Kingdom needs to be netted out to give a figure of monetary aggregates within Australia. Schedvin used the data sets in Butlin, Hall and White to pioneer the construction of time series of the money stock, the monetary base and reserve and currency ratios (Schedvin, 1973 and 1972). He made a number of adjustments to the Butlin, Hall and White data in the course of his compilations but none were directly concerned with the problems raised in this paper (Schedvin, 1973, pp. 589-593). Later students of Australian monetary experience, Pope (1986, Table 2, pp. 27-44) and Fane (1988, Statistical Appendix), have accepted the Schedvin and Butlin, Hall and White material relating to deposit liabilities held within Australia through the period under review. However, it should be noted that the series of M2 generated by Pope is below that of Schedvin by a margin of 3 per cent rising to around 7 per cent over the period under consideration. This divergence results from Pope's netting out of deposits held in trading banks by savings banks in his calculation of M2 whereas Schedvin makes this adjustment for M3 (Pope, 1986, pp. 27-28 and Schedvin, 1973, pp. 592-593). This elimination of the double counting of savings bank deposits does not affect the figure of M3 which is virtually identical in both series.

2.2. Measurements in Monetary Aggregates 1893-1914

The Schedvin series, presented in Table 1, suggests that a severe contraction in the stock of money occurred in the 1890s. In nominal terms M1 and M2 both contracted around 22 per cent from peak to trough. However, the various aggregates did not follow a uniform path with respect to the timing or the extent of their movements. As Table 1 shows, M1 peaked in 1888 and reached its nadir in 1893, while M2 peaked later in 1890 and reached its minimum value in 1898 after a marginal upward movement in 1895 and 1896. On the other hand, M3 peaked in 1892 before shrinking by 11 per cent to a trough in 1894, a figure matched again in

1898. Recovery to the previous peak was slow for all monetary aggregates. In nominal terms M1 surpassed its earlier peak figure in 1896, M2 in 1906 and M3 in 1900. The more rapid recovery of the latter resulted from the flight of depositors towards state-owned savings banks whose liabilities were guaranteed by colonial governments.

These data suggest that the contraction in two of the series of monetary aggregates, M1 and M2, predate the bank crashes of 1893. Only M3 peaked immediately before the banking crisis. Why then did monetary aggregates decline? Schedvin offers an explanation of the movements in monetary aggregates with reference to a Cagan-style analysis of changes in high powered money, or the monetary base, and ratios of currency and cash reserves to deposits (Schedvin, 1973, pp. 593-598 and 1972 and Cagan, 1965). The monetary base shrank quickly from £15.930m in 1887 to £3.648m in 1892, while its effect on the money stock was ameliorated to a degree by sharp falls in the reserve ratio from 7.38 per cent in 1887 to -5.22 per cent in 1893. This shift in the reserve ratio was reinforced by a marginal reduction in the currency ratio (Schedvin, 1973, pp. 601-605 and 1972)

Such an explanation clearly suggests that the bank suspensions in 1893 were not the primary cause of the contraction in monetary aggregates. The underlying cause, the shrinkage of the monetary base, predates the bank crashes by a number of years. However, there was a larger decline in all categories of the money stock, M1, M2 and M3, in 1893 than in any other single year. M1 fell nearly 11 per cent, M2 nearly 14 per cent and M3 marginally more than 10 per cent. The thrust of this paper is to argue that the bank crashes had an even more significant impact on broad money aggregates than these annual movements suggest.

Table 1: Butlin, Hall and White - Based Monetary Aggregates 1888-1914

	(£ms)		
Dec.	**M1**	**M2**	**M3**
1888	37.948	100.775	109.479
1889	36.153	104.348	113.787
1890	37.353	108.387	118.439
1891	35.197	108.232	119.572
1892	34.082	108.014	120.385
1893	30.788	94.985	109.314
1894	33.341	92.962	108.663
1895	38.558	94.191	111.585
1896	42.222	95.386	113.373
1897	41.717	91.875	111.399
1898	40.973	89.028	108.663
1899	46.052	94.876	116.787
1900	46.688	97.609	121.856
1901	47.792	98.608	124.904
1902	48.073	100.552	128.381
1903	47.387	98.912	127.646
1904	45.910	98.640	128.608
1905	47.091	105.162	135.600
1906	51.641	113.895	146.455
1907	57.879	120.535	156.916
1908	57.253	121.584	161.857
1909	58.279	125.856	168.665
1910	67.245	138.529	184.238
1911	77.077	154.834	206.951
1912	78.385	158.958	218.229
1913	74.908	156.280	221.998
1914	83.168	168.621	239.043

Source: Schedvin (1972).

3. ESTIMATE OF DEPOSIT LIABILITIES CONVERTED TO LONG-DATED MATURITIES 1893-1914

The purpose of this section of the paper is to provide an estimate of the liabilities incurred under the reconstruction schemes which should be netted out of measures of the money stock within Australia. It should be noted that contemporary estimates of the amounts of liabilities 'locked up' under the reconstruction schemes and the timetable of their repayment were published in the *Australian Trading World* and reprinted in the *Banker's Magazine* (1894, p. 869 and p. 890). These data are deficient in two respects. First, they are based on balance sheet figures which do not show the distribution of those liabilities between Australia and the United Kingdom. Second, the schedule of repayment was based on the schemes of arrangement agreed to in the middle of 1893. The schedule of release of funds did not always follow that laid down in the original schemes. Several banks meet their obligations in a shorter time frame than had been agreed upon. Others extended their timetable of repayments when five of the twelve banks were forced to seek revised schemes of arrangements with their creditors[6].

The estimates presented below follow the contemporary analysts by using the balance sheet data of individual banks rather than those based on colony and state data. Reconstructed banks usually showed their terminable and interminable deposit stock and deferred deposit receipts as a separate item in their accounts, while nearly all of these liabilities were included as 'deposit liabilities' in the quarterly data published in the various Government Gazettes. In those cases where reconstructed banks did not identify these types of exceptionally long dated liabilities in their accounts it has proved possible to estimate the amounts. The aggregate results for year ended December 1893 to 1914 are shown in Table 2. The data for each bank and the method of estimation are presented in Appendix B.

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[6] Those five banks were the Colonial Bank of Australasia, for details see *AIBR* (1895), pp. 364, pp. 431-432 and p. 594; English, Scottish and Australian Bank, for details see *AIBR* (1895), p. 796; (1896), pp. 113-114, p. 179 and p. 333 and (1896), pp. 417-418; Commercial Bank of Australia, for details see *AIBR* (1896), pp. 587 and pp. 671-672 and (1897), p. 84; Australian Joint Stock Bank, for details see *AIBR* (1897), pp. 228, pp. 318-321 and pp. 393-395; Queensland National bank, for details see *AIBR* (1896), pp. 783-785 and pp. 820-822 and (1897), pp. 6-7, pp. 68-69 and pp. 96-97 and (1897), pp. 167, pp. 214-216, pp. 231-242 and pp. 322-323.

However, the use of balance sheet data in Table 2 presents a problem insofar as nearly all the banks in question had assets and liabilities beyond Australia. Indeed, Australian banks had aggressively raised deposits in the United Kingdom during the 1880s so that in 1893 they comprised around £37m[7] or more than a third of all deposits held. However, there were marked differences between banks in their reliance on this market[8]. An Australian series of deferred liabilities has been constructed by subtracting an estimate of each of the reconstructed banks' United Kingdom liabilities incurred under its reconstruction scheme from its aggregate figure. An all reconstructed bank series has been generated by summing the individual data sets.

The method of estimation was to establish a benchmark figure of British deposits for each of the reconstructed banks. A statement of deposit liabilities in the United Kingdom at the time of suspension was often reported to the shareholders and creditors during the reconstruction process[9]. These data of United Kingdom deposits have been converted to a percentage of the deposits of the unsecured creditors of each bank falling under the reconstruction arrangement.

It has been assumed that all deposits held in the United Kingdom would have been fixed term and so subject to the scheme of arrangement. This assumption inflates the weight of Australian banks' United Kingdom deposits as they did accept current account[10] and government deposits in London which generally fell outside the reconstruction schemes. It is also assumed that depositors in the United Kingdom would have chosen to take up preference shares in similar proportions to Australian

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7 Estimate from *AIBR* (1893), p. 586. See also Boehm (1971), Table 47, p. 199.

8 Boehm (1971), Table 65, pp. 272-273. Estimates of the deposits held in the United Kingdom by the banks which reconstructed are given by Cork (1894), p. 216.

9 Australian Joint Stock Bank, *AIBR* (1893), pp. 331-332; Bank of North Queensland, *AIBR* (1893), p. 335; Bank of Victoria, *AIBR* (1893), p. 335; City of Melbourne Bank, *AIBR* (1893), p. 336; Colonial Bank of Australasia, *AIBR* (1893), p. 581; Commercial Bank of Australia, *AIBR* (1893), p. 241; Commercial Banking Company of Sydney, *AIBR* (1893), p. 335; English, Scottish and Australian Bank, *AIBR* (1893), p. 243; London Bank of Australia, *AIBR* (1893), p. 332; National Bank of Australasia, *AIBR* (1893), p. 695; Queensland National Bank, *AIBR* (1893), p. 335 and p. 775; Royal Bank of Queensland, *AIBR* (1893), p. 618.

10 The National Bank of Australasia had small current account deposits in London when it suspended. See *AIBR* (1893), p. 695.

deposit holders, and that the repayment schedules would have been the same for both classes of depositor.

Table 2: Trading Bank Deposits Converted To Deferred Deposit Receipts, Debentures and Inscribed Deposit Stock 1893-1914

	(£ms)	
Dec.	**Total[1]**	**Net of 'Other Liabilities'[2]**
1893	57.048	55.768
1894	49.800	47.325
1895	38.149	35.772
1896	32.865	30.567
1897	28.749	25.481
1898	26.834	23.620
1899	22.756	19.530
1900	20.114	16.867
1901	18.593	15.327
1902	17.768	14.486
1903	17.063	13.880
1904	16.628	13.411
1905	15.405	12.198
1906	14.726	11.483
1907	14.028	10.725
1908	13.662	10.290
1909	13.098	9.747
1910	10.378	6.972
1911	9.488	6.012
1912	8.868	5.320
1913	8.615	4.942
1914	7.404	3.802

Source: [1] As described in text and Appendix B.

[2] Total less sums identified in Appendix A as 'other liabilities'.

Table 3: Trading Bank Deferred Deposits, Debentures and Inscribed Deposit Stock held in Australia 1893-1914

	(£ms)	
	Column 1	Column 2
Dec.	Total	Net of 'Other Liabilities' held in Australia
1893	37.897	38.074
1894	32.615	32.015
1895	24.527	23.915
1896	20.929	20.323
1897	17.897	15.820
1898	16.617	14.572
1899	13.948	11.948
1900	12.012	10.035
1901	11.057	9.102
1902	10.564	8.636
1903	10.172	8.181
1904	9.927	7.970
1905	9.290	7.348
1906	8.984	7.062
1907	8.601	6.729
1908	8.420	6.609
1909	8.125	6.323
1910	6.651	4.902
1911	6.187	4.514
1912	5.907	4.283
1913	5.779	4.263
1914	5.234	3.678

Source: As described in text and Appendix C.

'Other liabilities' held in Australia are calculated by using a weighted average of the Australian and United Kingdom liabilities of the Colonial Bank of Australasia, English, Scottish and Australian Bank and Queensland National Bank.

The figures of United Kingdom deposits given for the City Bank of Melbourne, the Commercial Bank of Australia and the London Bank of Australia are implausibly high. City Bank of Melbourne, the Commercial Bank of Australia and the London Bank of Australia are implausibly high. In all cases they exceed the total of deposits brought under those banks' schemes of arrangement. Estimates of United Kingdom deposits of these banks have been calculated as a proportion of their total deposit liabilities at time of suspension. The 1893 ratios of the Australian-United Kingdom split of deferred deposits and inscribed stock have been applied to each of the annual figures. The aggregated results are shown in Table 3 and the detailed estimates for each bank are included in Appendix C.

4. ALTERNATIVE SERIES OF MONETARY AGGREGATES WITHIN AUSTRALIA 1893-1914

Having estimated the amount of deposits 'locked up' under the various schemes of arrangement it is possible to present an alternative series of monetary aggregates net of such liabilities. The data must be treated with caution. Even M1, currency in the hands of the public and current accounts in trading banks, is subject to biases. As noted above, the estimates of currency in the hands of the public in the 1890s rest on a projection of post-1900 per capita figures. Hoarding during the panic would not be reflected in the series being used. On the other hand, the current account figure is overstated to an unknown extent as most current accounts were swept into reconstruction schemes at their formation although they were released considerably faster than were fixed deposits[11].

It is now possible to compare the revised estimate of monetary aggregates with the series produced by Schedvin. Netting out the deposits locked up in long dated liabilities and stock suggests a significantly more severe contraction in monetary aggregates than the earlier series shows. Table 4 shows that the contraction is centred on the year 1893 when M2 falls by more than 47 per cent and M3 shrinks by 41 per cent. While the extent of the decline in monetary aggregates is far greater than that shown by the series based on the Butlin, Hall and White data, the length of time taken to rebuild monetary aggregates is virtually identical.

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[11] See 'Special Terms to Current Account Depositors' in 'Synopsis of the Schemes of Banking Reconstruction', *AIBR* (1893) pp. 766-769.

Table 4: Estimates of Revised Monetary Aggregates, M1, M2 and M3, Australia 1890-1914

	(£ms)		
Dec.	**M1**	**M2**	**M3**
1890	37.353	108.387	118.439
1891	35.197	108.232	119.572
1892	34.082	108.014	120.385
1893	30.788	56.911	71.240
1894	33.341	60.947	76.648
1895	38.558	70.276	87.670
1896	42.222	75.063	93.050
1897	41.717	76.055	95.579
1898	40.973	74.456	94.091
1899	46.052	82.928	104.839
1900	46.688	87.574	111.821
1901	47.792	89.506	115.802
1902	48.073	91.916	119.745
1903	47.387	90.731	119.466
1904	45.910	90.670	120.638
1905	47.091	97.814	128.252
1906	51.641	106.833	139.393
1907	57.879	113.806	150.187
1908	57.253	114.975	155.248
1909	58.279	119.533	162.342
1910	67.245	133.627	179.336
1911	77.077	150.320	202.437
1912	78.385	154.675	213.946
1913	74.908	152.017	217.735
1914	83.168	164.943	235.365

M1 Currency plus trading bank demand deposits. Schedvin (1972).

M2 Currency plus trading bank demand and time deposits. Schedvin (1972) series less data in Column 2, Table 3.

M3 Currency plus all trading bank and net savings bank deposits. Schedvin (1972) series less data in Column 2, Table 3.

5. LIQUIDITY OF LONG-DATED BANK LIABILITIES

It was argued above that the long-dated deposit receipts and deposit stock should be netted out from the money stock in view of the extension of the maturity of these liabilities. The series of M2 and M3 presented above in Table 4 represent the lower bound of monetary aggregates. While these 1893 bank deposits were 'locked up' as a different type of liability, they might still be considered as part of the stock of money. They possessed a degree of liquidity from late 1893 as a secondary market sprang up in these claims. Bank deposit receipts and stocks were traded on the Sydney Stock Exchange by September while these securities were placed on the official lists of the Sydney and Melbourne exchanges in December. The Official List of the Stock Exchange of Melbourne indicates that these stocks were traded on a daily basis in the first week of December[12]. A number of banks accepted deposit receipts at face value in settlement of their customers' outstanding debts. Private investors entered the market, particularly as rates offered by trading banks on their 24 month term deposits fell from 5 per cent in August 1893 to 3 per cent by October 1894 (Butlin et. al., 1971, Table 51 p. 494). Investment in deferred deposit receipts paying 4.5 per cent and debentures and stock paying between 4 and 4.5 per cent offered attractive yields if these liabilities could be purchased at a discount to their face value.

It has been possible to calculate the 'market value' of the outstanding liabilities of each bank at December of each year by multiplying the figures shown in Appendix C by the published price[13]. The resulting 'market value' series, shown in Table 5 (details for individual banks appear in Appendix D), is a weighted average of the individual bank series. This series could be analogous to the value of certificates of deposit and so included as part of monetary aggregates. It is clear that these assets were not as 'liquid' as bank deposit liabilities insofar as there was a spread between bid and ask prices. Furthermore, the instability and unpredictability of the means suggests a level of uncertainty about market price (Juttner 1987, pp. 86-87).

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[12] For an account of the market see *AIBR* (1893), pp. 858, p. 1088 and p. 1101 and (1895), pp. 81, pp. 149-150 and p. 163. Official List of the Stock Exchange of Melbourne held in University of Melbourne Archives.

[13] Price data was collected as quoted for December of each year where possible. If no quotation was available for that month the nearest date on either side was used. Prices were drawn from those quoted in the monthly stock exchange list in the *AIBR* and the annual survey of the Stock Exchange of Melbourne as reported in the *Argus* and *Age* newspapers.

Table 5: 'Market Value' of Deferred Deposit Receipts and Inscribed Deposit Stock within Australia 1893-1914

	(£ms)			
	Column 1	**Column 2**	**Column 3**	**Column 4**
Dec.	**'Face Value'**	**'Market Value'**	**Ratio: 'Market Value' to 'Face Value'**	**'Net Market Value'**
1893	37.897	29.075	0.7672	28.092
1894	32.615	25.443	0.7801	23.733
1895	24.527	19.225	0.7838	17.676
1896	20.929	16.623	0.7943	14.819
1897	17.897	13.021	0.7276	11.074
1898	16.617	12.844	0.7728	10.725
1899	13.948	10.728	0.7691	8.443
1900	12.012	9.398	0.7824	6.878
1901	10.955	7.808	0.7127	5.556
1902	10.564	6.829	0.6464	4.793
1903	10.172	7.062	0.6943	4.951
1904	9.927	7.044	0.7096	4.868
1905	9.290	7.061	0.7601	4.624
1906	8.984	7.590	0.8448	4.889
1907	8.601	6.898	0.8020	4.105
1908	8.420	6.387	0.7586	3.621
1909	8.125	6.303	0.7758	3.471
1910	6.651	5.807	0.8731	2.790
1911	6.187	5.386	0.8705	2.335
1912	5.907	4.799	0.8124	1.923
1913	5.779	4.599	0.7958	1.652
1914	5.234	3.961	0.7568	1.181

Source: Column 1. 'Face Value' - Table 3.

Column 2. 'Market Value' - Appendix D.

Column 4. 'Net Market Value' less market value of 'other liabilities'.

Table 6: Estimates of Revised Monetary Aggregates, M2 and M3 Including 'Market Value' of Deferred Deposit Receipts and Stock 1890-1914

	(£ms)	
Dec.	**M2***	**M3***
1890	108.387	118.439
1891	108.232	119.572
1892	108.014	120.385
1893	85.003	99.332
1894	84.680	100.381
1895	87.952	105.346
1896	89.882	107.869
1897	87.129	106.653
1898	85.181	104.816
1899	91.371	113.282
1900	94.452	118.699
1901	95.244	121.460
1902	96.709	124.538
1903	95.682	124.417
1904	95.538	125.506
1905	102.438	132.876
1906	111.722	144.282
1907	117.911	154.292
1908	118.596	158.869
1909	123.004	165.813
1910	136.417	182.126
1911	152.655	204.772
1912	156.598	215.869
1913	153.669	219.387
1914	166.124	236.546

Source: Adding 'market value' given in Table 5 *less* the market value of 'other liabilities' to M2 and M3 as shown in Table 4.

While no data on the volume of trades are available, it is likely that the market was 'thin'. Accepting these caveats, including this estimate of the value of the 'certificates of deposit' to the currency in the hands of the public and the unencumbered deposits held by trading banks within Australia would provide a generous upper bound for estimate of the stock of money from 1893 until 1914. The resulting series is shown in Table 6.

Even this upper bound calculation of M2* and M3* suggest a more severe contraction in monetary aggregates than the series produced by Schedvin. M2* contracted by 23 per cent in 1893 while M3* fell by 17.5 per cent over the same year. Once again, there was little difference between this and the other series with respect to the number of years elapsed before the earlier peaks were matched in nominal terms.

6. CONCLUSIONS

The revised series of monetary aggregates presented in this paper suggest a monetary contraction of unparalleled proportions in Australian history[14]. During the 1930s depression M3 fell by 13.33 per cent from its peak in the second quarter of 1928 to the third quarter of 1931. It had recovered to the 1928 figure in nominal terms by the second quarter in 1936 (Schedvin, 1970, pp. 203-210 and Appendix C, Table C-1, pp. 384-387). The contractions of broad money aggregates in 1946, 1952 and 1956 were minor by comparison and all had been recovered within the next year (Pope, 1986, Table 2). The relative magnitude of the monetary disturbance of the 1890s raises the question about the relationship between movements in monetary aggregates and the real economy in Australia from the banking crisis up until World War I.

[14] Juttner (1987) presents an annual series of M1 percentage change from 1900 to 1984, p. 84.

APPENDIX A: INTERMINABLE STOCK AND 'OTHER LIABILITIES' 1893-1914

	(£ms)				
	Column 1	Column 2	Column 3	Column 4	Column 5
Dec.	CBA	ES&A	QNB	Total	Other Liabilities
1893	0.871			0.871	1.280
1894	0.076	3.082		3.158	2.475
1895	0.025	3.042		3.067	2.377
1896		2.979		2.979	2.298
1897		2.884	3.117	6.001	3.268
1898		2.787	3.117	5.904	3.214
1899		2.749	3.117	5.866	3.226
1900		2.742	3.117	5.859	3.247
1901		2.733	3.117	5.850	3.266
1902		2.712	3.117	5.829	3.282
1903		2.699	3.117	5.816	3.183
1904		2.690	3.117	5.807	3.217
1905		2.682	3.117	5.799	3.227
1906		2.673	3.117	5.790	3.243
1907		2.664	3.117	5.781	3.303
1908		2.654	3.117	5.771	3.372
1909		2.644	3.092	5.736	3.351
1910		2.632	3.092	5.724	3.406
1911		2.621	3.092	5.713	3.496
1912		2.607	3.092	5.699	3.548
1913		2.591	3.092	5.683	3.673
1914		2.576	3.092	5.668	3.602

Source: Columns 1, 2, 3 data taken from balance sheets of Colonial Bank of Australasia, English, Scottish and Australian Bank and Queensland National Bank as published in *AIBR.* Column 5, as shown in Table 12, Butlin Hall and White, December Quarter.

APPENDIX B: DEPOSIT RECEIPTS AND INSCRIBED DEPOSIT STOCK BY BANK 1893-1914

	(£ms)												
Dec.	**AJS[1]**	**BNQ[2]**	**BVic[3]**	**CMB[4]**	**Colonial[5]**	**CBA[6]**	**CBCS[7]**	**ESA[8]**	**LBA[9]**	**NBA[10]**	**QNB[11]**	**RBQ[12]**	**Total**
1893	8.046	0.208	4.623	2.468	1.642	6.874	8.103	4.630	4.845	6.333	8.560	0.716	57.048
1894	7.656	0.156	4.623	2.468	1.642	6.374	6.003	4.025	4.348	5.418	6.387	0.700	49.800
1895	6.709	0.114	4.201		1.642	5.774		3.932	3.862	5.088	6.143	0.684	38.149
1896	5.375	0.050	3.209		1.554	5.331		3.845	3.716	3.266	5.851	0.668	32.865
1897	5.375	0.050	2.355		1.438	5.266		3.384	3.261	1.658	4.950	0.652	28.749
1898	5.719	0.050	1.500		1.267	4.796		3.267	3.189	1.611	4.946	0.489	26.834
1899	5.690	0.018	0.450		1.037	4.414		3.218	2.233	0.479	4.891	0.326	22.756
1900	5.301	0.018			0.361	4.348		3.176	1.912		4.835	0.163	20.114
1901	5.182	0.016			0.111	3.972		2.942	1.591		4.779		18.593
1902	4.478					3.752		2.906	1.589		4.723		17.768
1903	4.698					3.375		2.791	1.587		4.612		17.063
1904	4.370					3.311		2.780	1.586		4.581		16.628
1905	4.083					2.974		2.682	1.258		4.408		15.405
1906	4.070					2.719		2.673	0.942		4.322		14.726
1907	3.767					2.508		2.664	0.939		4.150		14.028
1908	3.751					2.257		2.654	0.936		4.064		13.662
1909	3.705					1.956		2.644	0.926		3.867		13.098
1910	2.149					1.553		2.632	0.608		3.436		10.378
1911	1.730					1.185		2.621	0.602		3.350		9.488
1912	1.711					0.631		2.607	0.589		3.330		8.868
1913	1.673					0.515		2.591	0.546		3.290		8.615
1914	1.634					0.041		2.576			3.153		7.404

Sources:

1 Australian Joint Stock Bank: Deferred deposits shown in accounts 12/93-12/96 and 12/99-12/14; inscribed deposit stock shown in accounts 12/93-12/14. Estimation procedure for deferred deposits 12/97. Amended scheme of reconstruction postponed repayments of deferred deposits from 1/96 to 1/1900 *AIBR*, April 1897, p. 228.

2 Bank of North Queensland: Interminable debenture deposits shown in accounts 12/95-6/1902; deferred deposits estimated by amount of liabilities at time of suspension coming under scheme of management and repayments noted in reports to shareholders, *AIBR*, February 1894, p. 97; August 1894, p. 546; February 1895, p. 107; February 1896, p. 107; August 1895, p. 523; August 1896, p. 588.

3 Bank of Victoria: The estimation procedure was to calculate the deposit liabilities converted to deferred deposits from the number of preference shares on offer. 20 per cent of deposits could be taken up as preference shares. Thereafter repayments as noted in the reports accompanying the bank's accounts were progressively deducted from the initial sum. Details of the scheme of arrangement and the accounts and reports were published in the *AIBR*. Scheme of arrangement reported in *AIBR*, August 1893, p. 767.

4 City of Melbourne Bank: The estimation procedure was the same used for the Bank of Victoria. Depositors could take up to 20 per cent of their claims as preference shares. The number of shares on issue allowed the calculation of an initial figure involved in the scheme of arrangement. No repayment had been made prior to the bank going into liquidation in July 1895. Scheme of arrangement reported in *AIBR*, August 1893, p. 767. The bank's accounts were balanced in September. That figure is used for December.

5 Colonial Bank of Australasia: The estimation procedure was to use the value of preference shares which depositors could take, 25 per cent of their claims, to calculate the amount of deposits included under the scheme of arrangements. The reports accompanying the accounts give the amounts of deferred deposits outstanding at each balance date. A figure of deferred deposit receipts appears in the accounts from 3/97 to 9/90. The scheme of arrangement and the reports and accounts appear in the *AIBR*. The bank's September balance figure is used as a December figure.

6 Commercial Bank of Australia: Data of 'extended deposit receipts' for 12/93 and 12/95 from R.J. Wood, *The Commercial Bank of Australia Limited*, p. 197; 12/94 in accounts as shown in *AIBR*, February 1895, pp. 104-105. Extended deposits 'A' series 12/98 to 6/1905 shown in Accounts; Extended deposits 'B' series were removed from balance sheet of bank to Trust Realisation Accounts from 1898 to 1908, thereafter shown in accounts of bank.

7 Commercial Banking Company of Sydney: Deposits included in scheme of arrangement as given in *AIBR*, June 1893, pp. 616-617; repayment schedule as reported in *AIBR*, November 1895, p. 731.

8 English, Scottish and Australian Bank: December 1893 is figure of liabilities of 'old bank' at date of suspension as given in *AIBR*, June 1893, p. 606. The figures for succeeding years of both perpetual stocks and terminable deposit receipts taken from accounts as reported in *AIBR*. The bank balanced its accounts in June. The balance figure is used as the December figure.

9 London Bank of Australia: Fixed deposits in the 'old bank' appear in the accounts from 12/93 to 12/96. Thereafter they appear as 'terminable deposit receipts'. Accounts reported in *AIBR*.

10 National Bank of Australasia: Deferred deposits appear in the accounts from 9/93 to 9/96. The latter figures are estimated by progressively deducting the amounts repaid within each accounting period as indicated in the reports accompanying the accounts as published in the *AIBR*. The September balance figure is used as the December figure.

11 Queensland National Bank: Figures include deferred deposits, interminable inscribed deposit stock and deferred government deposits. All are taken from the bank's accounts with the exception of the figure for 12/96 which is taken from the revised scheme of arrangement as reported in *AIBR*, April 1897, p. 237.

12 Royal Bank of Queensland: The deposit liabilities at the time of suspension and the repayment schedule for current and term deposits is taken from the scheme of arrangement as published in *AIBR*, June 1893, p. 618. The split between current and term deposits at the time of suspension has been taken from the March quarter banking averages for Queensland as reported in *AIBR*, May 1893, p. 321.

APPENDIX C: ESTIMATE OF DEPOSIT RECEIPTS AND INSCRIBED STOCK HELD BY BANKS WITHIN AUSTRALIA 1893-1914

	(£ms)												
Dec.	**AJS**	**BNQ**	**BVic**	**CMB**	**Colonial**	**CBA**	**CBCS**	**ESA**	**LBA**	**NBA**	**QNB**	**RBQ**	**Total**
1893	4.586	0.119	3.421	0.666	1.642	2.956	7.536	4.074	1.938	5.066	5.478	0.415	37.897
1894	4.364	0.089	3.421	0.666	1.642	2.741	5.583	3.542	1.739	4.334	4.088	0.406	32.615
1895	3.824	0.065	3.109		1.642	2.483		3.460	1.545	4.070	3.932	0.397	24.527
1896	3.064	0.029	2.375		1.554	2.292		3.384	1.486	2.613	3.745	0.387	20.929
1897	3.269	0.029	1.743		1.438	2.264		2.978	1.304	1.326	3.168	0.378	17.897
1898	3.260	0.029	1.110		1.267	2.062		2.875	1.276	1.289	3.165	0.284	16.617
1899	3.243	0.010	0.333		1.037	1.898		2.832	0.893	0.383	3.130	0.189	13.948
1900	3.022	0.010			0.361	1.870		2.795	0.765		3.094	0.095	12.012
1901	2.954				0.111	1.708		2.589	0.636		3.059		11.057
1902	2.735					1.613		2.557	0.636		3.023		10.564
1903	2.678					1.451		2.456	0.635		2.952		10.172
1904	2.491					1.424		2.446	0.634		2.932		9.927
1905	2.327					1.279		2.360	0.503		2.821		9.290
1906	2.320					1.169		2.352	0.377		2.766		8.984
1907	2.147					1.078		2.344	0.376		2.656		8.601
1908	2.138					0.971		2.336	0.374		2.601		8.420
1909	2.112					0.841		2.327	0.370		2.475		8.125
1910	1.225					0.668		2.316	0.243		2.199		6.651
1911	0.986					0.510		2.306	0.241		2.144		6.187
1912	0.975					0.271		2.294	0.236		2.131		5.907
1913	0.954					0.221		2.280	0.218		2.106		5.779
1914	0.931					0.018		2.267			2.018		5.234

Source: As described in text.

APPENDIX D: ESTIMATE OF MARKET VALUE OF DEPOSIT RECEIPTS AND INSCRIBED STOCK HELD BY BANKS IN AUSTRALIA 1894-1914

	(£ms)												
Dec.	**AJS**	**BNQ**	**BVic**	**CMB**	**Colonial**	**CBA**	**CBCS**	**ESA**	**LBA**	**NBA**	**QNB**	**RBQ**	**Total**
1893	3.153	0.091	2.523	0.504	1.016	2.365	6.782	2.903	1.405	4.179	3.835	0.318	29.075
1894	3.004	0.069	2.566	0.519	0.934	1.919	5.583	2.508	1.348	3.610	3.066	0.317	25.443
1895	3.105	0.051	2.276		1.007	2.111		2.273	1.275	3.867	2.949	0.311	19.225
1896	2.108	0.023	2.337		1.088	1.616		2.656	1.201	2.665	2.622	0.307	16.623
1897	1.984	0.021	1.757		1.025	1.879		2.323	1.058	1.353	1.346	0.275	13.021
1898	2.341	0.022	1.110		0.992	1.736		2.208	1.148	1.289	1.779	0.219	12.844
1899	2.118	0.008	0.336		0.933	1.666		2.155	0.908	0.387	2.072	0.145	10.728
1900	2.031	0.008			0.343	1.588		2.370	0.778		2.206	0.074	9.398
1901	1.914	0.007			0.105	1.259		2.123	0.641		1.759		7.808
1902	1.605					1.140		1.941	0.631		1.512		6.829
1903	1.861					1.032		1.844	0.592		1.733		7.062
1904	1.826					0.998		1.766	0.586		1.868		7.044
1905	1.752					0.895		1.843	0.503		2.068		7.061
1906	1.884					1.061		2.049	0.383		2.213		7.590
1907	1.314					0.970		2.006	0.385		2.223		6.898
1908	1.075					0.865		1.930	0.371		2.146		6.387
1909	1.187					0.757		1.885	0.370		2.104		6.303
1910	0.946					0.635		1.945	0.247		2.034		5.807
1911	0.776					0.498		1.937	0.245		1.930		5.386
1912	0.731					0.264		1.769	0.236		1.799		4.799
1913	0.679					0.215		1.733	0.207		1.765		4.599
1914	0.663					0.018		1.641			1.639		3.961

Source: As described in text.

REFERENCES

Age, Melbourne.

Argus, Melbourne.

Australasian Insurance and Banking Record, Sydney.

Banker's Magazine, London.

Boehm, E.A. (1971), *Prosperity and Depression in Australia 1887-1897*, Oxford University Press, Oxford.

Butlin, S.J., Hall, A.R. and White, R.C. (1971), *Australian Banking and Monetary Statistics 1817-1945*, Occasional Paper No. 4A, Reserve Bank of Australia.

Cagan, P. (1965), *Determinants and Effects of Changes in the Stock of Money 1875-1960*, National Bureau of Economic Research, Studies in Business Cycles, 13, New York.

Cork, N. (1894), "The Late Australian Banking Crisis", *Journal of The Institute of Bankers*, 15, pp. 175-211.

Fane, G. (1988), "The Development of Monetary Institutions in Australia from Federation to the Second World War", *Economic History Society of Australia and New Zealand Biennial Conference*, Canberra, mimeograph.

Juttner, D.J. (1987), *Financial Markets, Interest Rates and Monetary Economics*, Longman Cheshire, Melbourne.

Merrett, D.T. (1988), "The 1893 Bank Crashes: The Aftermath", Economic History Joint Seminar, The Australian National University, mimeograph.

Pope, D. (1986), "Australian Money and Banking Statistics", *Australian National University Source Papers in Economic History*, No. 11.

Pope, D. (1989), "Free Banking in Australia Before World War I", *Australian National University Working Papers in Economic History*, No. 129.

Schedvin, C.B. (1970), *Australia and the Great Depression*, Sydney University Press, Sydney.

Schedvin, C.B. (1973), "A Century of Money in Australia", *Economic Record*, 49, pp. 558-605.

Schedvin, C.B. (1972), "Stock of Money and Three Determinants, Australia, 1841-1939", mimeograph.

Stock Exchange of Melbourne, *Official List*.